Technical Specifications for

FORTIFIED UHT MILK
-Palestine-

Specification reference: **Fortified UHT milk** for Palestine
Version: **V14.0**
Date of issue: **28 April 2014**
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1. SCOPE

This standard prescribes the requirements for **Fortified UHT milk** for Palestine.

2. STANDARDS AND RECOMMENDATIONS

The following referenced standards are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced standard (including any amendments) applies.

- CAC/MRL 02-2006, Maximum residue limits for veterinary drugs in foods
- CAC/RCP 57, Code of hygiene practice for milk and milk products
- CODEX STAN 1: General standard for the labelling of pre-packaged foods
- CODEX STAN 192-1995, Codex general standard for food additives
- CODEX STAN 193, Codex general standard for contaminants and toxins in foods

3. DEFINITIONS

Milk
Means the normal, clean and fresh secretions, without any addition or subtraction, extracted from the udder of a healthy cow, and free from colostrums, i.e. excluding that got during the first seven days after calving.

Pasteurized milk
Milk which has been subjected to pasteurisation.

Homogenization
Process by which milk fat globules are finely divided and interspersed to form a homogeneous product so as to prevent the fat from floating on the surface and adhering to the inside of the container.

UHT milk
The milk, ultra-high temperature treated, homogenized, filled and sealed aseptically into sterile retail containers in order to achieve commercial sterility.

Commercial sterility
The attained practical sterility after the product has been treated aiming at absolute sterility.

4. RAW MATERIALS

4.1 Milk

UHT milk shall be produced from milk which conforms to Codex Stan 206-1999 definition, i.e. 'Milk is the normal mammary secretion of milking animals obtained from one or more milkings without either addition to it or extraction from it, intended for consumption as liquid milk or for further processing'.

4.2 Vitamins and minerals

Table 1 - The required fortification per 100 mL of ***Fortified UHT milk***

Micro nutrient	**Unit**	**Recommended level (per 100ml)**		**Chemical from**
		Minimum	*Maximum*	
Zinc	mg	0.40	0.50	Zinc lactate
Vitamin D	mcg	1.00	1.25	Cholecalciferol
Vitamin A	mcg	40.00	50.00	Retinyl acetate
Thiamin (B1)	mg	0.10	0.125	Thiamin mononitrate
Riboflavin (B2)	mg	0.10	0.125	Riboflavin 5'-phosphate, sodium
Pyridoxine (B6)	mg	0.08	0.10	Pyridoxine 5'-phosphate
Niacin (B3)	mg	1.50	1.875	Nicotinic acid
Iron	mg	2.00	2.50	Ferric sodium diphosphate
Folic acid (B9)	mcg	100.00	125.00	Folic acid
Cobalamin (B12)	mcg	0.20	0.25	hydoxocobalamin

Complete micronutrient premixes must be purchased from a WFP approved supplier: BASF (Stern Vitamin), DSM, Fortitech, Hexagon Nutrition, Nicholas Piramal or their authorized dealers and GAIN premix facility. Addresses of premix suppliers are on http://foodqualityandsafety.wfp.org

Micronutrient premixes must be delivered to the processor of **Fortified UHT Milk** with a complete Certificate of Analysis as well as with a Proof of purchase of premixes. The two documents must be presented with other documents for payment.
Micronutrient premixes must be stored in a dry, cool and clean place.

5. PROCESSING

5.1 Formula

The milk shall be subjected to temperatures between 135 °C and 150 °C for 2 to 6 seconds, sufficient to attain commercial sterility, followed by immediate cooling to ambient temperature and aseptically packaged in sterile containers.

5.2 Direct heat

Where steam injection is used for heating, only culinary steam shall be used, and the compositional quality of the milk shall be the same before and after treatment.

5.3 Holding time before sale

UHT milk shall be held by the processor at ambient temperatures for at least seven days before release to the market. When samples are tested organoleptically after this storage, the flavour shall be normal, and all signs of spoilage shall be absent.

5.4 Shelf life

UHT milk shall have a minimum shelf life of 6months.

5.5 Homogeneity of micronutrients

Theoretical calculations indicate that a mixing system with a Coefficient of Variation of 10% using iron as the indicator element, will enable product to meet the above variation target on 95%, provided that all conditions of mixing are rigorously applied. To conduct these calculations see the WFP handbook: Fortified Blended Food- Good Manufacturing Practice and HACCP Principles and fortification guide on http://foodqualityandsafety.wfp.org

5.6 Food safety and risk assessment at manufacturing premises

For compliance with Codex standards the processor must be able to demonstrate by principle and practice the adoption, implementation and recording of:

- Good Manufacturing Practice
- Hazard Analysis Critical Control Point program

In this context an appointed WFP Inspector / Quality Surveyor is entitled to visit the factory without prior notice during any period when WFP product is being manufactured to check that the GMP and HACCP systems are in place. The Inspector/ Quality Surveyor may request to see:

- **Records** (i.e. names of people in charge of the process and quality control, temperatures of the process, mixing times / quantity, cleaning schedules, etc).
- **Procedures** (e.g. cleaning, personnel hygiene, HACCP, sampling and analysis).
- **Instructions** (e.g. process instructions, cleaning instructions).
- The **quality manual** for the process or factory.

The manufacturer must be ***registered under national food law*** as a processor of foods for human consumption.

6. PRODUCT SPECIFICATIONS

6.1 General requirements

Milk shall be produced, processed and handled in accordance with CAC/RCP 57.
Note: Reference to CAC/RCP 57 does not mean an endorsement of the use of actoperoxidase system as a means of preservation of raw milk as contained therein.

Average nutritional values per 100g **Fortified UHT Milk**:

- Energy: 60 kcal
- Protein: 3 g min

- Fat: 2 g min
- Carbohydrates 4.5 g min

Fortified UHT Milk shall comply with the requirements given in Table 2.

*Table 2- Chemical requirements for **Fortified UHT Milk***

	Whole milk	**Fat reduced milk**	**Low fat milk**	**Fat free milk**	**Test method**
pH variation on 7 days incubation (units max.)	0.3	0.3	0.3	0.3	
Titratable acidity variation on 7 days incubation, % lactic acid (units max.)	0.02	0.02	0.02	0.02	
Milk fat (%)	3.25%, min.	1.51-3.24%	0.51-1.50%	0.50% max.	ISO 2446
Milk solids not fat (% min.)	8.5	8.5	8.5	8.5	ISO 6731

Note: Solids-non-fat content is calculated from total solids and fat contents.

The density of the milk at 20 °C shall be not less than 1.028 g/ml and not more than 1.036 g/ml.

Milk shall not contain added water. When determined in accordance with ISO 5764, the freezing point depression of milk shall be not less than 0.525 °C and not more than 0.550 °C.

UHT milk shall be normal in texture and colour. It shall be processed without affecting the composition of the product and can be flavoured with chocolate, strawberry, vanilla or banana. Flavouring agents' usage should conform to Codex Alimentarius Standards and Good Manufacturing Practices.

UHT milk shall be fortified with a mineral and vitamin premix as mentioned in table 1.

6.2 Microbiology

UHT milk shall comply with the microbiological limits given in Table 3.

*Table 3 — Microbiological limits for **Fortified UHT Milk***

Micro-organism	**Maximum level**	**Test method**
Total plate count, per 10 mL	10	ISO 4833
Total Coliforms, per mL	absent	ISO 21528-1
Escherichia coli per mL	absent	ISO 11866

6.3 Contaminants

- ***Aflatoxin*** M1: < 0.5 mcg/kg
- ***Heavy metals***

The products covered by this Standard shall comply with the maximum limits as specified in CODEX STAN 193-1995 rev. 2009.

- Lead: < 0.02 mg/kg

- ***Pesticide residues***

The products covered by this Standard shall comply with the maximum residue limits established by the Codex Alimentarius CAC/MRL 01-2009.

- ***Veterinary drug residues***

The products covered by this Standard shall comply with the maximum residue limits specified in CAC/MRL 02-2009.

6.4 Fit for human consumption guarantee

Suppliers shall have to check the quality of their products and guarantee that they are '**fit for human consumption'**.

7. PACKAGING

UHT milk shall be packaged in properly sealed, safe, food grade sanitised packaging materials. The product when marketed shall be packaged in well-sealed packaging materials in order to prevent spoilage or contamination of the product.
The packaging material used for **Fortified UHT Milk** shall be a 150 mL Tetra Pak® having the following requirements:

- lightproof
- gas proof
- mechanically strong
- non-toxic
- not impart any off-flavour to the milk
- able to withstand aseptic packaging pre-treatment procedure
- able to allow hermetic sealing

Fortified UHT Milk shall be packaged aseptically into sterile packaging material and sealed hermetically.
Fortified UHT Milk packages shall be not deformed, creased, dented or have crushed corners.

8. LABELLING

The containers shall be labelled in accordance with provisions of the CODEX STAN 1-1985. In addition, the following particulars shall be legibly and indelibly labelled on the container:

- name of the product
- net content in volume (in mL)
- name and address of manufacturer
- batch or code number
- the date of manufacture and expiry of the product
- instruction for storage and hygienic handling of the product
- any other additional requirements stipulate in the contract

9. STORING

Fortified UHT Milk must be stored under dry, ventilated and hygienic conditions.